STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

STEELHEAD JUNCTION

ROAD PLAN

SECTIONS 02, 14, 15, TOWNSHIP 12 NORTH, RANGE 08 WEST, W.M.
PACIFIC COUNTY

LEWIS DISTRICT

AGREEMENT NO.: 30-079385 LEAD FORESTER: Dean Adams

DATE: 06/01/2006 STAFF ENGINEER: Greg Johnson

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes, but is not limited to new construction including:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition, manufacture, and application of rock;
grass seeding.

This project also includes but is not limited to optional reconstruction including:

Road	Station (s)	Requirements
D-100	1+14 to 7+75	Clearing, grubbing, right-of-way debris disposal, reconstruct ditches, install ditch-outs and reconstruct excavation slopes. Apply and compact 12” of 4 INCH IN PLACE rock. Construct landing @ sta 7+75. Apply grass seed.

This project also includes but is not limited to pre-haul maintenance including:

Road	Station (s)	Requirements
Trap Creek E-Line	0+00 to 3+20, 3+90 to 6+55	Clean all ditches as needed. Pave bridge approaches with a 4” lift of asphalt.
	5+63 to 6+55	Reconstruct excavation slope to provide sufficient width for ditch and road surface.
	3+20 to 3+90	Replace bridge rails.
	0+00 to 130+85	Grade, crown and compact existing road surface.
Trap Creek A-Line	0+00 to 74+10	Grade, crown and compact existing road surface.
D-Line	0+00 to 51+15	Grade, shape and pull ditch.
D-1000	0+00 to 33+72	Grade, shape and pull ditch.
D-1030	0+00 to 5+70	Grade, shape and pull ditch.

This project also includes but is not limited to rock pit work including:

Rock Pit	Location(s)	Requirements
D-1000 Pit	SW ¼, Section 15, T12N, R8W	Excavate and end-haul 500 c.y. of overburden material to designated waste areas.

SECTION 1 - GENERAL CLAUSES

1.1-1

Clauses in this plan apply to all construction, reconstruction, or pre-haul maintenance including landings unless otherwise noted.

1.1-2

Pre-haul maintenance of the following roads is required. All roads shall be pre-haul maintained on the State's location and in accordance with this Road Plan.

Road	Stations	Type
Trap Creek E-Line	0+00 to 130+85	Pre-haul maintenance
Trap Creek A-Line	0+00 to 74+10	Pre-haul maintenance
D-Line	0+00 to 51+15	Pre-haul maintenance
D-1000	0+00 to 33+72	Pre-haul maintenance
D-1030	0+00 to 5+70	Pre-haul maintenance

1.1-3

Construction of the following roads is not required. Roads used by the Purchaser shall be constructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
Spur A	0+00 to 2+97	Construction
E-2200	0+00 to 10+02	Construction
D-50	0+00 to 3+97	Construction
D-100	0+00 to 1+14	Construction
D-100	1+14 to 7+75	Reconstruction

1.1-4

If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-7

Hauling of forest products or equipment may require a county road hauling permit. Purchaser is responsible for obtaining a permit, and any costs associated with extra maintenance or repair levied by a county.

1.2-1

The construction, reconstruction or pre-haul maintenance of any roads specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed, reconstructed or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application and/or timber haul.

1.3-2

Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.

1.4-3

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

1.5-2

Roads shall be maintained in a condition that will allow the passage of light administrative vehicles.

1.5-3

Snowplowing shall not be permitted unless authorized, in writing, by the Contract Administrator.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

2.1-3

Right-of-way timber shall not be decked within the grubbing limits or in locations that interfere with the construction of the road prism or impede drainage.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-1

Right-of-way debris shall be scattered outside the grubbing limits.

4.2.3-2

Right-of-way debris shall not be placed against standing timber.

SECTION 5 - EXCAVATION

5.1-1

Roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3

Road grade and alignment shall conform to the State's marked location. The reconstruction of existing road grades shall conform to the original location. Grade and alignment shall have smooth continuity, without abrupt changes in direction.

Construction limitations are as follows:

Favorable Grade	Adverse Road Grade	Minimum Curve Radius
18%	12%	60 feet

Changes in road grade shall not exceed 6% within 100 feet. Adverse grades on curves shall not exceed 10% of the curve radius.

5.1-4

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

5.1-5

Curve widening, where required, shall be added to the inside of curves.

5.1-7

Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-8E

On the following road, Purchaser shall reconstruct the subgrade to provide enough width for a one foot shoulder on each side of the bituminous surface.

Road	Stations
Trap Creek E-Line	0+00 to 3+20 and 3+90 to 6+55

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Embankments shall be widened as follows:

Height at Centerline	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table:

Material Type	Embankment Slope Ratio
Common Earth and Rounded Gravel	1½:1
Angular Rock	1¼:1
Sandy Soils	2:1

5.1-12

Organic material shall be excluded from road subgrade and embankment.

5.1-14

Where side slopes exceed 45 percent, full bench construction shall be utilized for the entire subgrade width.

5.1-16

Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit with final subgrade alignment and sight distances. Location shall be subject to written approval of the Contract Administrator.

5.1-18

Turnarounds shall be no larger than 30 feet long and 30 feet wide.

5.1-20

Purchaser shall reshape, clean or construct ditches and reconstruct excavation slopes to provide sufficient width for ditches and road surface. Excavated slopes shall be consistent with Clause 5.1-8. Excavated material shall be scattered outside the grubbing limits.

5.1.1-1

Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-2

Waste material shall not be deposited within 100 feet of a live stream.

5.1.1-3

Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.1.1-5

When constructing landings, waste material and embankment shall not be placed on side slopes steeper than 45%.

5.1.1-6

On the following road, full bench construction shall be utilized with all excavated material end hauled or pushed to designated waste areas.

End Haul/Waste Material Disposal

Road	Stations	Waste Area Location
E-2200	1+41 to 3+40	3+40

5.1.1-8

The amount of material to be contained in a waste area shall be at the discretion of the Contract Administrator.

5.2-1

Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.

5.3-1

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.4-1

Silt-bearing runoff shall not be permitted to go into streams.

5.4-2

Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3.1

On the following roads, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

Mixture Percent by Weight	Minimum Percent Germination
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:

1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Required seed not spread by the termination of this contract shall become property of the State.

Road	Stations	Seed Quantity (lbs)
Spur A	0+00 to 2+97	10
E-2200	0+00 to 10+02	40
D-50	0+00 to 3+97	10
D-100	0+00 to 7+75	20
D-1000 Pit waste area		10

5.5-4

Constructed or reconstructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

5.5-5

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

5.5-6

On the following roads, a grader shall be used to shape the existing surface and the surface shall be compacted full width except ditch. Compaction shall be by smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

Road	Stations
Trap Creek A-Line	0+00 to 74+10
Trap Creek E-Line	0+00 to 130+85

SECTION 6 - DRAINAGE

6.2.1-1

Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-2

Manufacturer's approved hinged split coupler bands shall be used on corrugated polyethylene pipe, bands shall have a minimum of 4 corrugations, 2 on each side of the pipe joint.

6.2.1-5

On all roads that are constructed or reconstructed: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State. Purchaser shall stockpile materials as directed by the contract administrator.

6.2.2.1-1

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the National Corrugated Metal Pipe Association "Installation Manual for Corrugated Steel Drainage Structures" and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.4-1

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

SECTION 7 - ROCK

7.1-1

Rock for construction and/or reconstruction under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with the attached written "Development Plan" prepared by the State. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan. The Purchaser shall give the Contract Administrator 5 days notice prior to commencing any operations in the listed rock pits.

Source	Location
D-1000 Pit	SW ¼, Section 15, T12N, R8W

7.1-3
All rock source operations shall be conducted as directed by the Contract Administrator.

7.1-6
Rock for construction, reconstruction, and/or pre-haul maintenance under this contract may be obtained from any commercial source, as approved in writing by the Contract Administrator.

7.1-7
The following pit work is required. Work is to be done according to the approved "Pit Plan" and as directed by the Contract Administrator.

Source/ Location	Requirements
D-1000 Pit	Excavate and end-haul 500 c.y. of overburden material to designated waste areas

7.2.1-4
Rock shall meet the following specifications for gradation when placed in hauling vehicles

7.2.1.1-1
1 INCH MINUS CRUSHED ROCK

% passing 1" square sieve	100%
% passing ⅜" square sieve	50 - 80%
% passing U.S. #4 sieve	30 - 60%
% passing U.S. #10 sieve	25 - 50%
% passing U.S. #40 sieve	15 - 30%
% passing U.S. #200 sieve	5 - 15%

All percentages are by weight.

7.2.1.1-8
4 INCH IN PLACE rock shall have a minimum of 90 percent of the top 4 inches of the running surface pass a 4 inch square opening. In place processing such as grid rolling, jaw crushing, or other such method as demonstrated by the Purchaser to be effective, shall be required if necessary to achieve this requirement.

7.2.1.1-9
6 INCH MINUS ROCK

% equal to, or smaller in one dimension than the specified size	100%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-10
8 INCH PLUS ROCK

% equal to, or larger in one dimension than the specified size	100%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-12
Landing rock shall be no coarser than 6 INCH MINUS.

7.2.1.2-2
4 INCH IN PLACE rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash.

7.2.3-1

Measurement of the landing rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.2.3-1A

Measurement of the1 INCH MINUS CRUSHED rock shall be on scaled truck volume. Scaled volume shall be provided by a commercial scale. The Contract Administrator shall be provided with all scale sheets.

7.2.4-1

Rock drilling and shooting shall meet the following specifications:

a. Oversize material remaining in the rock source at the conclusion of the timber sale shall not exceed 5 percent of the total volume mined for the sale.

b. Oversize material is defined as rock fragments larger than two feet in any dimension.

c. The Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 10 working days prior to any drilling. (Form #M-126PAC).

7.4.2-1

Apply at least the minimum rock depth as shown on the ROCK LIST.

7.4.2-1A

On the following road, Purchaser shall apply 1 INCH MINUS CRUSHED rock on the road shoulder. Rock shall be applied, shaped, and compacted to insure a smooth transition from the asphalt concrete surface to the shoulder of the road. Any damage to the asphalt surface shall be repaired at the Purchaser's expense as directed by the Contract Administrator.

Road	Stations
Trap Creek E-Line	0+00 to 3+20 and 3+90 to 6+55

7.4.2-5

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-8

Apply 50 cubic yards of rock to each landing.

7.4.2-9

Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-2

Rock shall be spread and compacted full width in lifts not to exceed 8 inches uncompacted depth. Compaction shall be by smooth drum vibratory roller weighing at least 14,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

7.5-1

"Asphalt Concrete Class B"

"Asphalt Concrete Class B" shall conform with Sections 5-04 except 5-04.5 shall be deleted of the 2004 issue of "Standard Specifications for Road, Bridge, and Municipal Construction" by Washington State Department of Transportation (WSDOT).

8.2-3

Requirements for the asphalt bridge approaches:

a. Existing surface rock shall be removed a minimum of 6 inches below the existing road surface elevation between stations 0+00 to 3+10 and 4+00 to 6+55 and stockpiled at station 6+70.

b. Existing surface rock and subgrade shall be removed a minimum of 16 inches below the existing bridge deck elevation between stations 3+10 to 3+20 and 3+90 to 4+00 and stockpiled at station 6+70.

c. ONE INCH MINUS rock shall be shaped and compacted in lifts not to exceed 6 inches to a level of 4 inches below bridge deck elevation.

d. Subgrade, crushed rock, and asphalt shall be crowned and shaped according to the ASPHALT PAVEMENT DETAIL.

e. A 4 inch lift (compacted depth) of “Asphalt Concrete Class B” shall be applied on the Trap Creek E-Line between station 0+00 to 3+20 and 3+90 to 6+55. Asphalt concrete shall be placed, leveled, and compacted to an elevation even with the adjacent bridge deck. Placement shall be in accordance with Sections 5-04.3(9) and 5-04.3(10) from the current version of Standard Specifications For Road, Bridge, and Municipal Construction by Washington State Department of Transportation, except that 5-04.3(10) is amended so as not to require pneumatic tired rollers between October 1 and April 1. Areas that are to be leveled shall have "Asphalt Concrete Class B" applied at a depth determined by the Contract Administrator. "Asphalt Concrete Class B" shall be graded to provide an even grade and contour. At the ends of leveling areas the asphalt shall be feathered so that a smooth tapered edge or joint will result.

   Asphalt shall be applied and compacted in two 2 inch lifts by a steel wheeled roller weighing not less than 20,000 pounds and conform with Section 5-04.3(10)A of the WSDOT. All damaged asphalt resulting from construction shall be replaced in one contiguous mat. Edges will be cut with a saw, perpendicular to the traveled way, and a tack coat of emulsified asphalt applied.

f. The Purchaser shall suspend operations when, in the opinion of the Contract Administrator, weather is such that unsatisfactory results cannot be obtained.

8.3-5

On the following road, the bridge shall have the guard rails replaced. The Purchaser shall dispose of all old bridge rail material off of State Land, procure and install new guard rails.

The guard rails shall be constructed of pressure treated 12"x 12" No. 2 or better, Douglas fir or Western Hemlock with 6"x 12" pressure treated spacer blocks. The guard rails shall be fastened with 3/4"x 22" galvanized machined bolts with nuts and washers. The machine bolt holes shall be pre-drilled and treated.

Road	Stations
Trap Creek E-Line	3+20 to 3+90

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

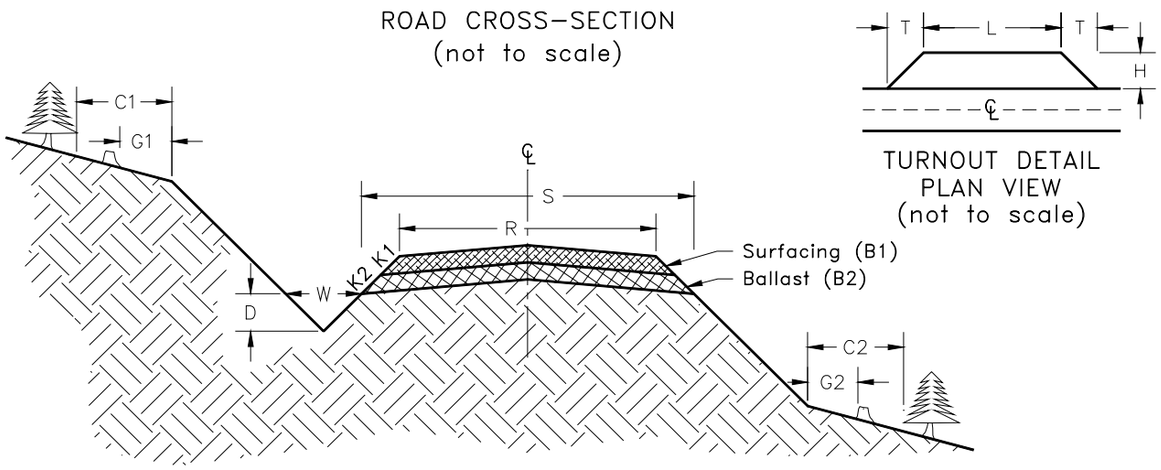
9.2-2

Purchaser shall provide for drainage of the landing surface as approved, in writing, by the Contract Administrator.

9.2-3

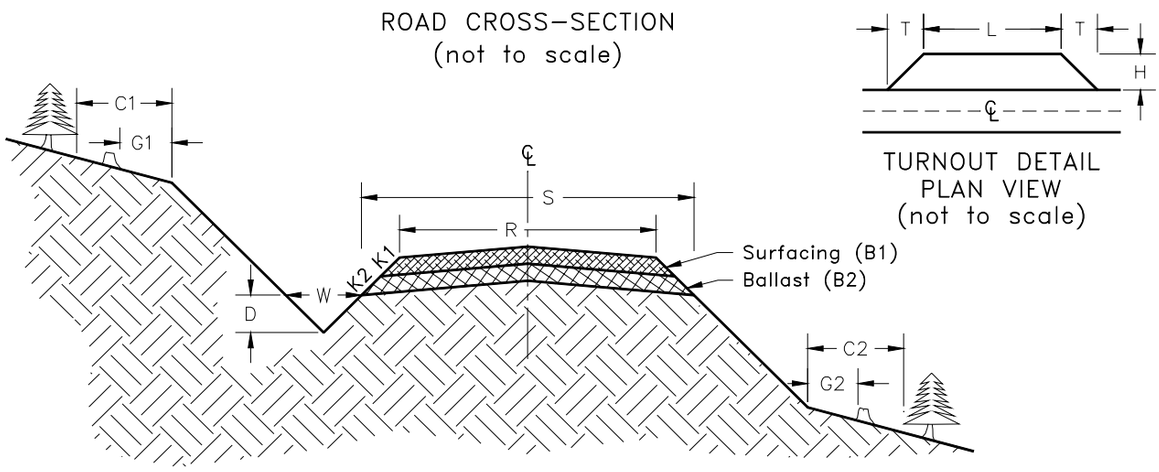
Landing embankments shall be sloped to original construction specifications.

TYPICAL SECTION SHEET



Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
						Width	Depth					
				S	R	W	D		G1	G2	C1	C2
Spur A	0+00	2+97	C	16’	12’	3’	1’	4”	5’	5’	10’	10’
E-2200	0+00	10+02	C	16’	12’	3’	1’	4”	5’	5’	10’	10’
D-50	0+00	3+97	C	16’	12’	3’	1’	4”	5’	5’	10’	10’
D-100	0+00	7+75	C	16’	12’	3’	1’	4”	5’	5’	10’	10’
Trap Creek E-Line	0+00	6+55	A	16’	12’	3’	1’	2”	-	-	-	-
	6+55	130+85	C	16’	12’	--	--	4”	-	-	-	-
Trap Creek A-Line	0+00	74+10	C	18’	14’	--	--	2”	-	-	-	-
D-Line	0+00	51+15	C	16’	12’	--	--	4”	-	-	-	-
D-1000	0+00	33+72	C	16’	12’	--	--	4”	-	-	-	-
D-1030	0+00	5+70	C	16’	12’	--	--	4”	-	-	-	-

ROCK LIST



BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout Length	Turnout Width	Turnout Taper
			K2	B2					L	H	T
					4 INCH IN PLACE			D-1000 Pit			
Spur A	0+00	2+97	1 ½: 1	15”	81	2.97	241				
	Landing (1)		--	--	50	1	50				
	Curve widening		--	--	50	1	50				
E-2200	0+00	10+02	1 ½: 1	17”	93	10.02	932		50’	10’	25’
	Landing (1)		--	--	50	1	50				
	Turnout (1)		--	--	93	1	93				
	Curve widening		--	--	50	1	50				
D-50	0+00	3+97	1 ½: 1	15”	81	3.97	322				
	Landing (1)		--	--	50	1	50				
	Curve widening		--	--	50	1	50				
D-100	0+00	1+14	1 ½: 1	17”	93	1.14	106				
	1+14	7+75	1 ½: 1	12”	63	6.61	416				
	Landing (1)		--	--	50	1	50				
	Curve widening		--	--	50	1	50				
	Misc. Landings (4)		--	--	50	4	200				
					8 INCH PLUS						
	Culverts		--	--	--	--	3				

4 INCH IN PLACE TOTAL 2,710 Cubic Yards
8 INCH PLUS TOTAL 3 Cubic Yards

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1				
					ONE INCH MINUS			Commercial
Trap Creek E-Line	0+00	3+20	1 ½: 1	2”	13	3.2	42	
	3+90	6+55	1 ½: 1	2”	13	2.65	35	
	Shoulders		1 ½: 1	--	4	5.85	23	

SURFACE TOTAL 100 Cubic Yards

STEELHEAD JUNCTION

ROAD PLAN MAP

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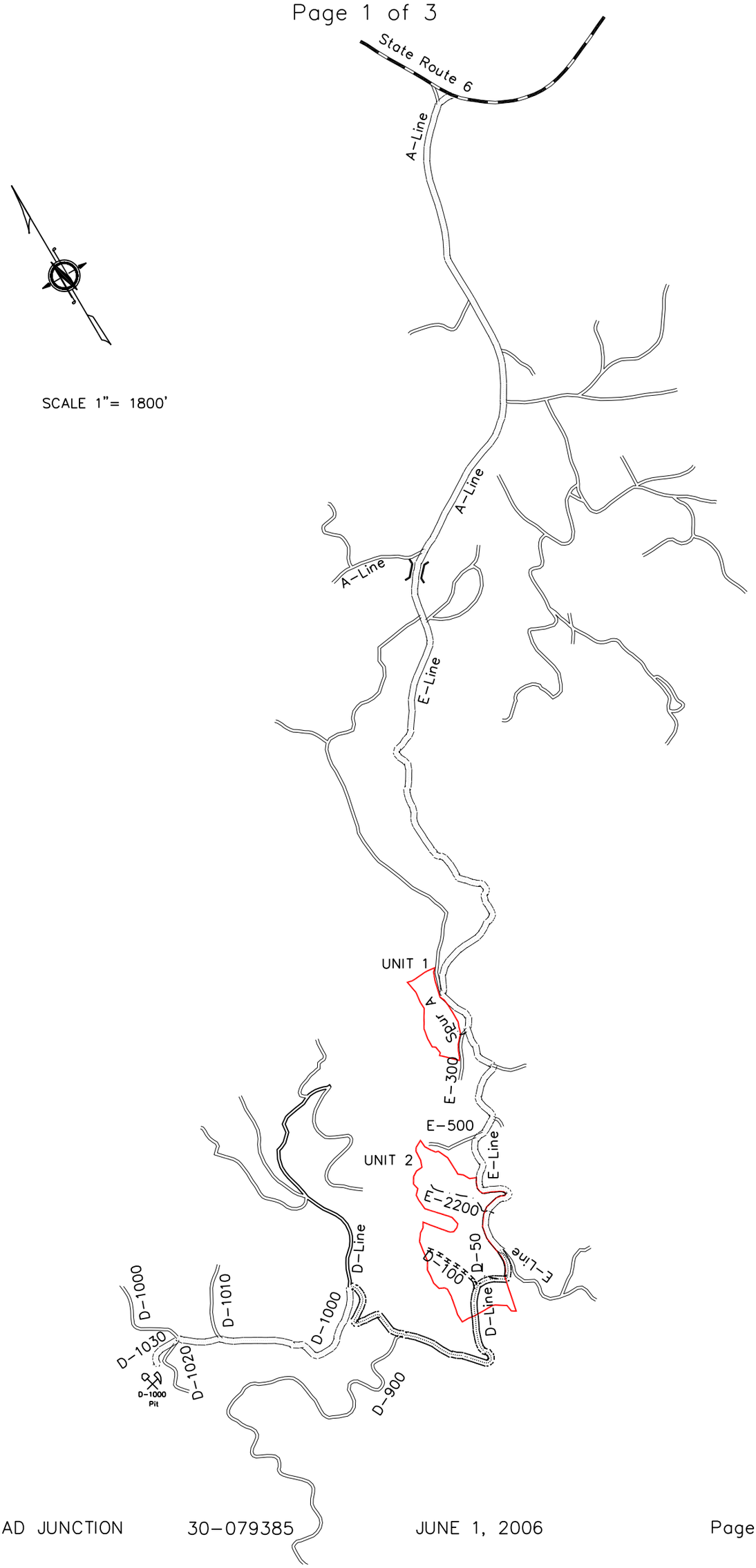
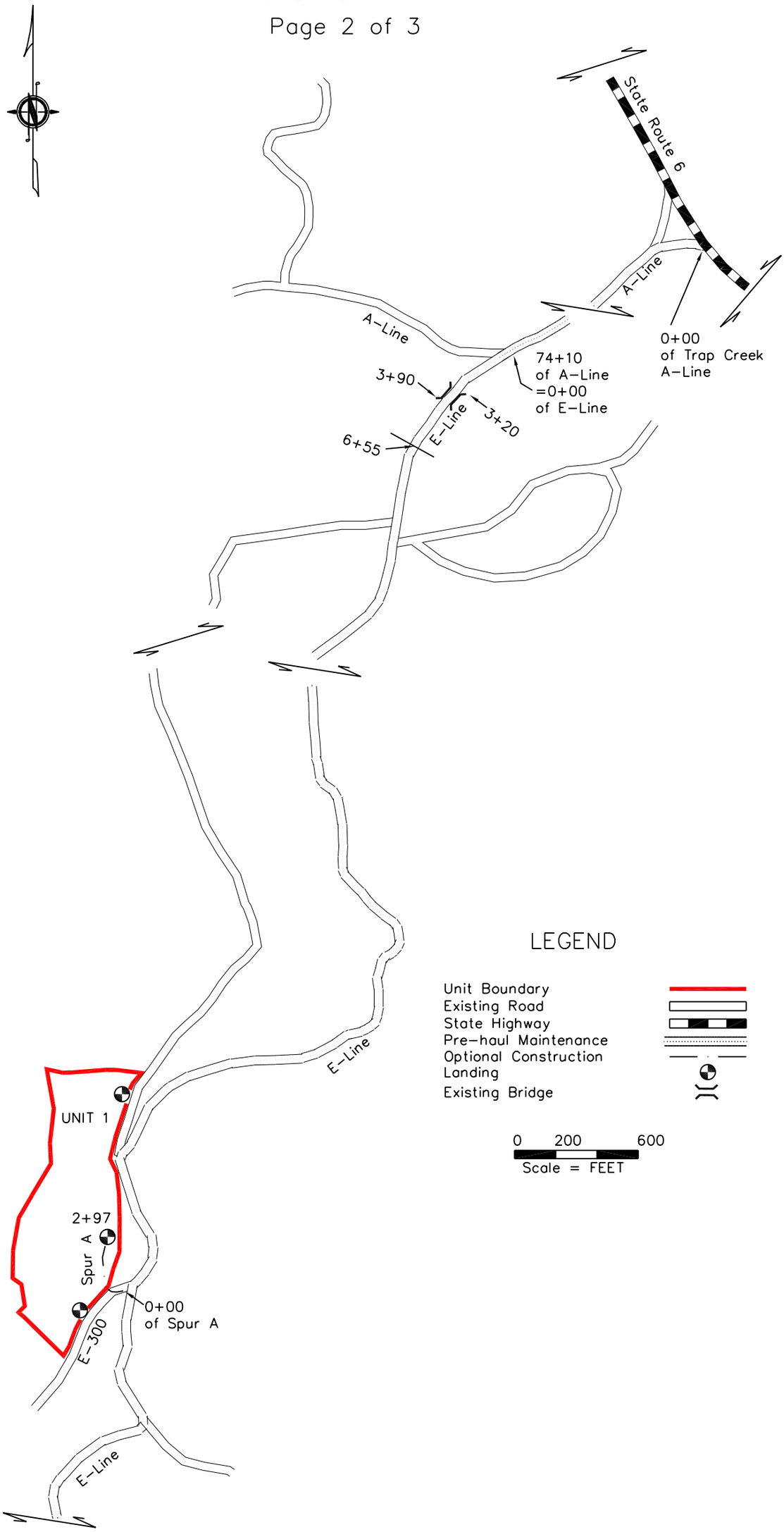


STEELHEAD JUNCTION

ROAD PLAN MAP

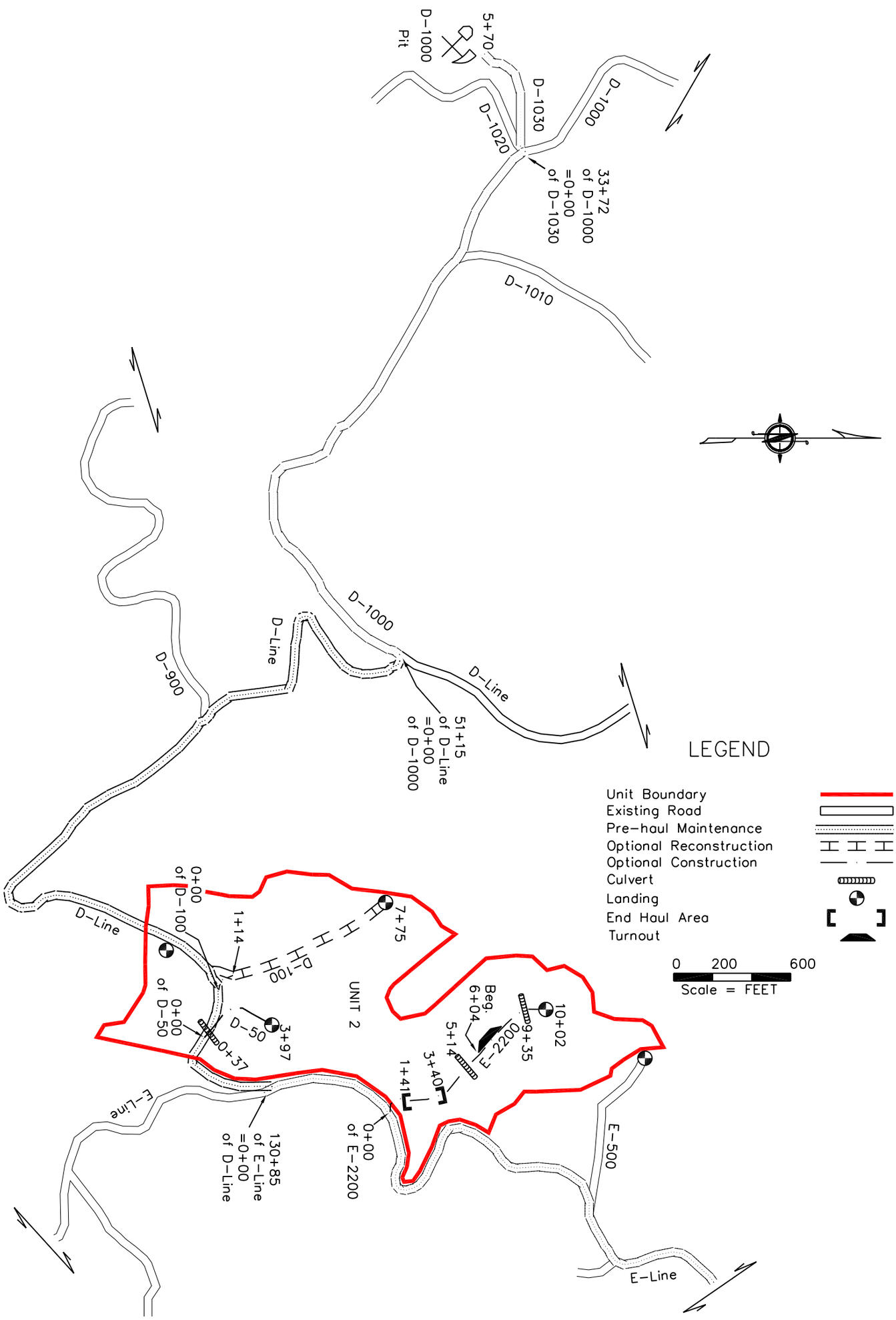
Page 2 of 3



STEELHEAD JUNCTION

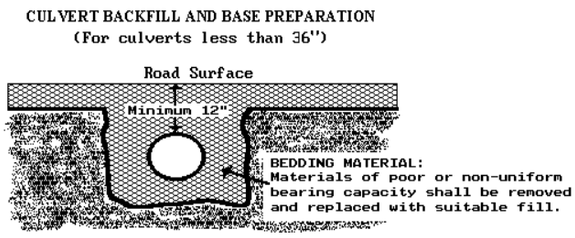
ROAD PLAN MAP

Page 3 of 3



CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Length (ft) Downspt	Length (ft) Flume	Riprap (C.Y.) Inlet	Riprap (C.Y.) Outlet	Riprap (C.Y.) Type	Backfill Material	Placement Method	Const. Staked	Remarks
			If Steel										
E-2200	5+14	18”	-	32’	-	-	0.5	0.5	8”	NT	-	-	Cross drain
	9+35	18”	-	32’	-	-	0.5	0.5	8”	NT	-	-	Cross drain
D-50	0+37	18”	-	40’	-	-	0.5	0.5	8”	NT	-	-	Cross drain

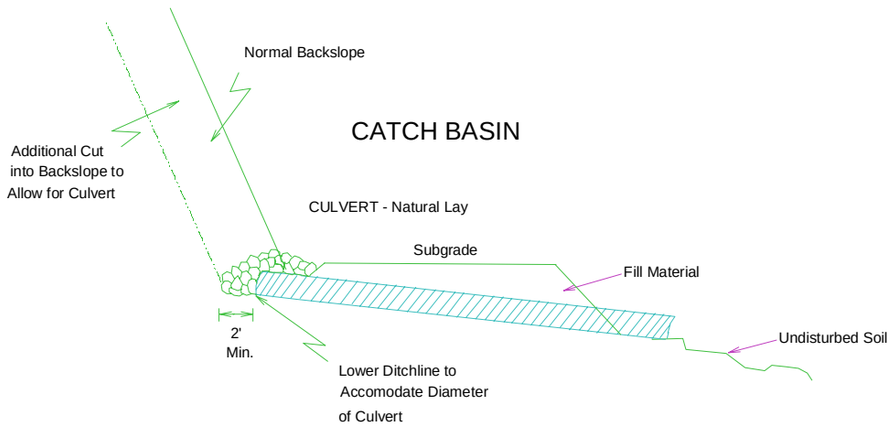


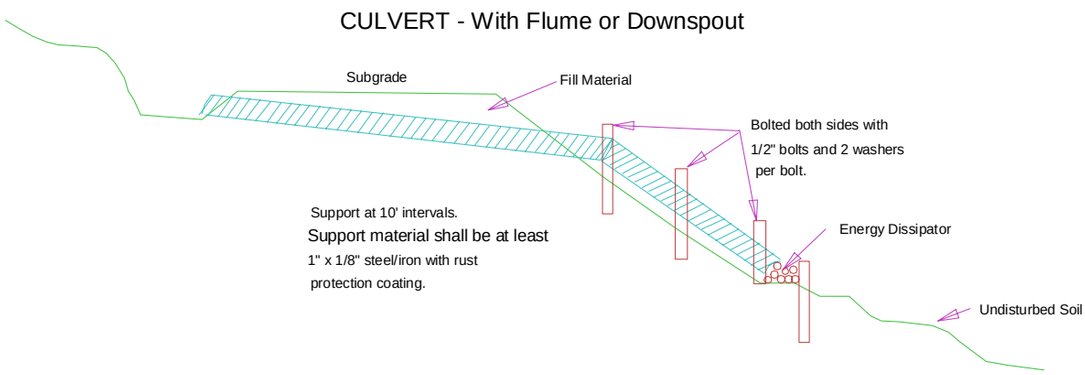
Key:

8” - 8 Inch Plus
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

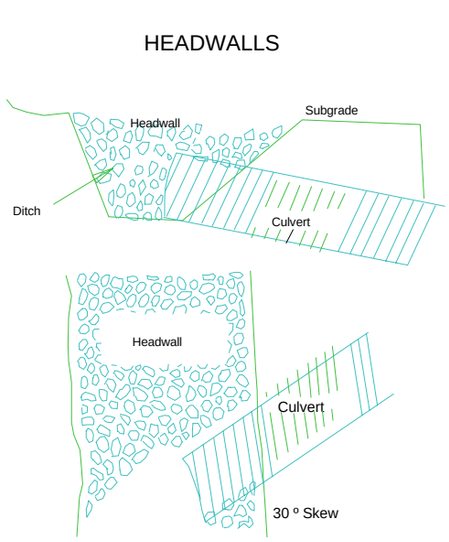
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)

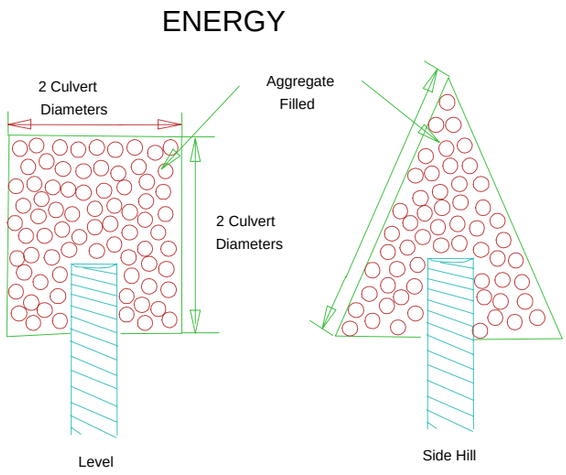




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

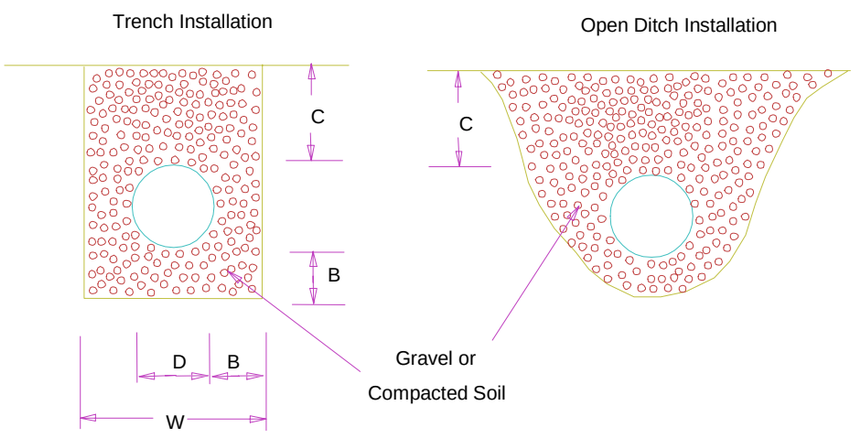
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% of that material is required. This minimum compaction can be achieved by either hand or mechanical tamping. Purchaser shall test the compaction level and bare all associated costs.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to ½:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

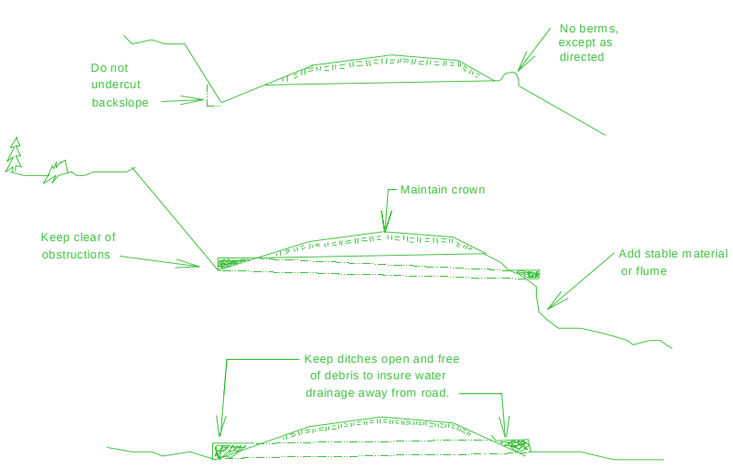
B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

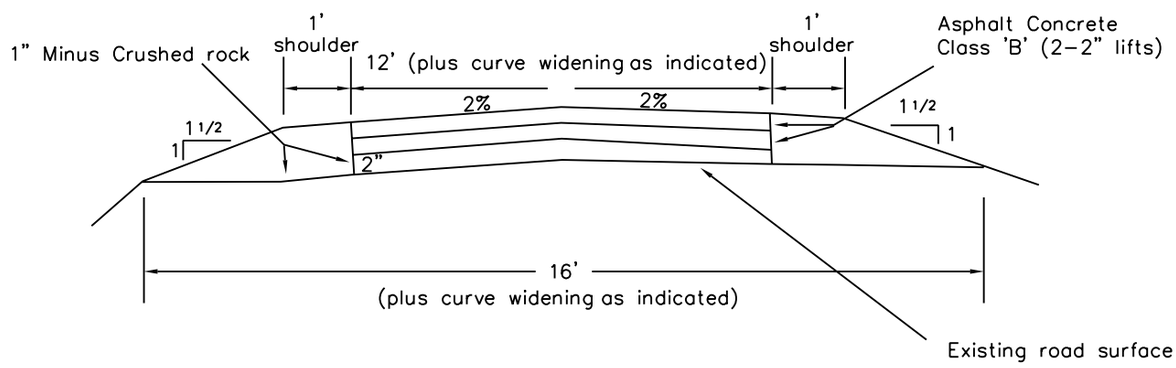
F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.

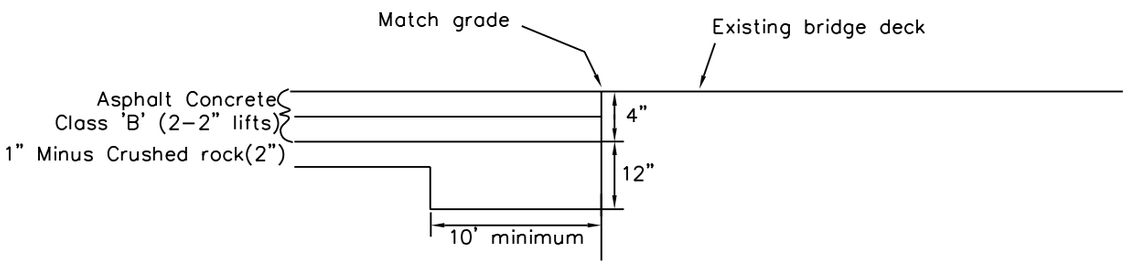


ASPHALT PAVEMENT DETAIL

Not To Scale

CROSS SECTION





STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
CENTRAL REGION

TRAP CREEK D-1000 ROCK PIT DEVELOPMENT PLAN

NW ¼, SW ¼, Section 15, Township 12 North, Range 08 West, W.M.

1. Development shall begin in Area A.

2. All vegetation including stumps shall be cleared a minimum of 20 feet beyond the top of all working faces. Trees shall be cleared to a minimum of ¾ of the height of the tallest tree adjacent to the pit.

3. Overburden shall be end hauled to the designated waste area and compacted. Minimal acceptable compaction is achieved by placing waste material in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts.

4. Root wads and organic debris larger than one cubic foot in volume shall be separated from overburden material and piled in the designated waste area.

5. Pit faces shall not exceed 30 feet in height and shall be sloped no steeper than 1/4:1.

6. Working bench width shall be a minimum of 30 feet.

7. The pit floor shall have continuity of slope, providing drainage to the south at a minimum of 2 percent.

8. The location and amount of material to be placed in a stockpile are subject to approval of the Contract Administrator.

9. Oversize material remaining in the rock source at the conclusion of use shall not exceed 5 percent of the total volume mined during that operation. Oversize material is defined as rock fragments larger than two feet in any direction. At the conclusion of operations, oversize material shall be placed as directed by the Contract Administrator.

10. At the end of operations, pit faces and walls shall be scaled and cleared of loose and overhanging material, benches shall have safety berms constructed or access blocked to highway vehicles.

11. All exposed soil in the waste area shall be grass seeded in accordance with Road Plan clause 5.4-3A.

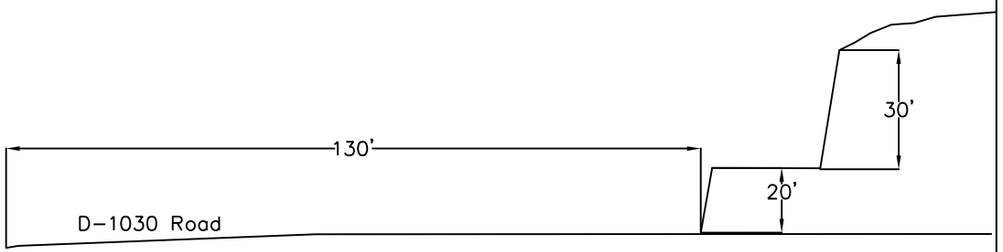
12. Reclamation will not be required following use.

13. All operations shall be carried out in compliance with all regulations of:
    a. Regulations and Standards Applicable to Metal and Nonmetal Mining and Milling Operations (30 CFR) U.S. Department of Labor, Mine Safety and Health Administration.
    b. Safety Standards for Construction Work (296-155 WAC), Washington Department of Labor and Industries.
    c. “Safety Standards for Construction Work” (296-155 WAC), Washington Department of Labor and Industries.

14. The Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 10 working days prior to any drilling (Form #M-126PAC).

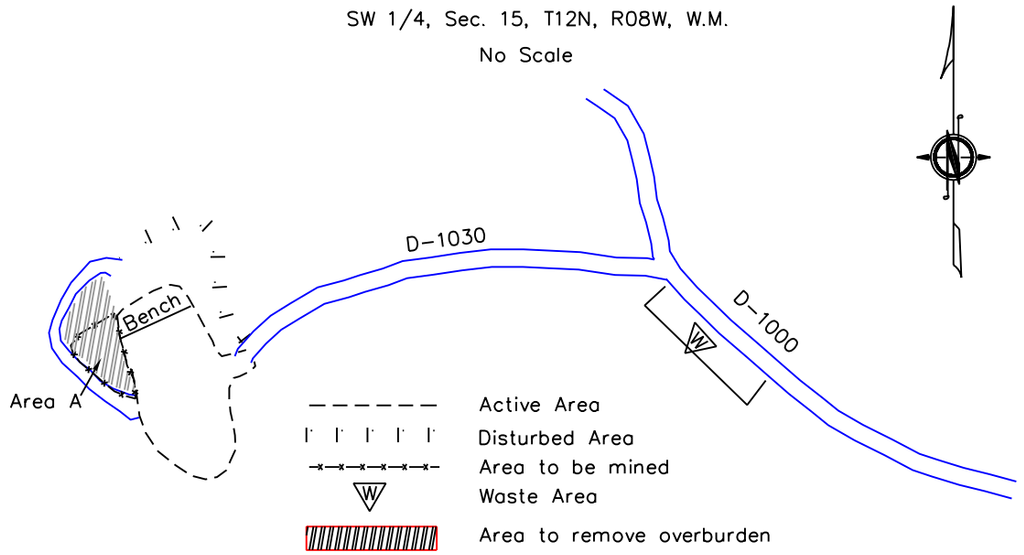
15. At the completion of rock source operations, Purchaser shall ask Contract Administrator for written approval of final rock source condition and compliance with the terms of this plan.

Date of update 5/06/06.

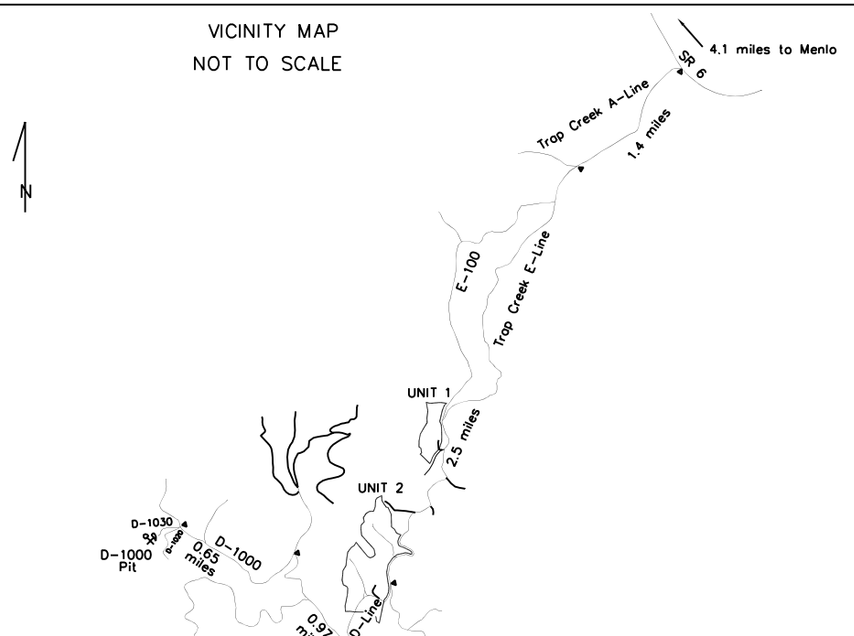


Typical Cross-Section

D-1000 Pit
SW 1/4, Sec. 15, T12N, R08W, W.M.
No Scale



VICINITY MAP
NOT TO SCALE



DEVELOPMENT

Overburden and debris shall be deposited in waste areas approved by State Representative.

Mining shall begin in Area A.

Contractor shall maintain a 20 foot wide stripped area from the pit face at all times.

All stock piled material shall be maintained in a neat and usable condition.

All operations shall be carried out in accordance with all Federal and State L & I regulations and State Mining WAC.

RECLAMATION

At the end of operations, quarry faces and walls shall be scaled and cleared of loose and overhanging material. Upon completion of operations in the quarry, the area will be left in a condition that will not endanger public safety, damage property, or be hazardous to human life or animals.

The pit area shall be worked and left in condition that future operations may proceed in an orderly manner.

Upon completion of operations, the site shall be cleared of all temporary structures, equipment and rubbish, and shall be left in a neat and presentable condition.

D-1000 Pit
SW 1/4, Sec. 15, T12N, R08W, W.M.

DEPARTMENT OF NATURAL RESOURCES - PACIFIC CASCADE REGION

FORM 9-87(Rev. 12-02)

SUMMARY - Road Development Costs

DISTRICT: Lewis

SALE/PROJECT NAME: Steelhead Junction CONTRACT NUMBER: 30-079385

LEGAL DESCRIPTION: Sections 14, 15, T12N, R8W

ROAD NUMBER:	Spur A, E-2200, D-50, D-100	D-100 Recnstr. & A-Line/E-Line grading	Trap Creek E-Line
ROAD STANDARD:	Secondary road (12' R.S.)	Spur road (12' R.S.)	Bridge approach paving (12' R.S.)
NUMBER OF STATIONS:	18.10	302.13	5.85
SIDESLOPE:	0	0	0
CLEARING AND GRUBBING:	$4,007	$2,210	$4,100
EXCAVATION AND FILL:	$5,232	$436	$22,000
ROCK TOTALS (Cu. Yds.):			
Ballast: 2710	$21,151	$3,839	$0
Surface: 100	$0	$0	$1,156
Riprap: 0	$0	$0	$0
CULVERTS AND FLUMES:	$1,257	$0	$0
STRUCTURES:	$0	$0	$2,300
GENERAL EXPENSES:	$2,848	$713	$2,660
MOBILIZATION:	$1,090	$1,090	$1,090
TOTAL COSTS:	$35,585	$8,290	$33,306
COST PER STATION:	$1,966	$27	$5,693

NOTE: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $77,181

SALE VOLUME MBF = 2,597

TOTAL COST PER MBF = $29.72

Plans to be furnished by:

Plan only: STATE

Plan-profile:

Compiled by: Greg Johnson Date: 04/10/06

Checked by: _____ Date: _____

Region Engineer: _____ Date: _____

Div of Engr.: _____ Date: _____

REMARKS: _____

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Steelhead Junction CONTRACT NUMBER: 30-079385

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur A, E-2200, D-50, D-100	30%	35	1.00	2.66	$40	1.00	18.10	$1,926
								$0
								$0
								$0
R/W CUTTING					$115		18.10	$2,082

Clear and Grub TOTAL = $4,007

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
Spur A, E-2200, D-50, D-100	30%	1.00	2.50	$88	1.00	18.10	$3,982
							$0
							$0
							$0
							$0

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul		1	$1,250	$1,250
Large Fills/ Cuts				$0

Excavation TOTAL = $5,232

III. BALLAST AND SURFACING :

Ballast source: D-1000 Pit
Surface source:
Riprap source :

Description	cu.yds/sta	x stations	= cubic yards
Ballast (4"-)	127	18.10	2,294
Surfacing (2 1/2"-)		18.10	0
Riprap			

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot	$2.50		
Dig and load	$1.00		
Crushing			
Purchase			
Haul *	$3.50	$3.50	$3.50
Spread	$0.80		
Compact	$0.45		
Strip	$0.97		
Reclamation			
TOTAL ($/cy)	$9.22	$3.50	$3.50

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	4.0						
Ave. Speed =	15	Ballast (4"-)	2294	Cu. yds @	$9.22	/cu. yd =	$21,151
Delay (Hrs.)=	0.2	Surfacing (2 1/2	0	Cu. yds @	$3.50	/cu. yd =	$0
Cost / Hour =	$75.00	Riprap	0	Cu. yds @	$3.50	/cu. yd =	$0
CY / Load =	10						

Rock total = $21,151

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
	2		18	32	$11.80	$755
	1		18	40	$11.80	$472
Bands & Gaskets	3				$10.00	$30

Culvert total = $1,257

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $31,647

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $2,848

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	5	$500
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer (D8)	400	1	$400
Front end loader	400	1	$400
Backhoe	$240	1	$240
Dozer (D5)	$240	1	$240
Drill	$240	1	$240

Total Mobilization = $3,270 Mobilization sub-total = $1,090

Road No. Spur A, E-2200, D-50, D-100
Standard: Secondary road (12' R.S.)
Stations: 18.10

SHEET TOTAL = $35,585

By: Greg Johnson Sheet 2 of 4 Date: 04/10/06

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Steelhead Junction CONTRACT NUMBER: 30-079385

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
D-100 Recnstr. & A-Line/E-Line gradin	N/A				$40		6.61	$264
R/W CUTTING					$20		6.61	$132
Grade & compact A-Line					$8.85		74.10	$656
Grade & compact E-Line					$8.85		130.85	$1,158
Grade D-Line					$4.50		51.15	$230
Grade D-1000/ D-1030					$4.50		39.42	$177
						Clear and Grub TOTAL =		$2,210

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
D-100 Recnstr. & A-Line/E-Line gradin	N/A	1.00	1.00	$66	1.00	6.61	$436
					1.00	6.61	$0
					1.00	74.10	$0

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				
Large Fills/ Cuts				

Excavation TOTAL = $436

III. BALLAST AND SURFACING :

Ballast source: D-1000 Pit
Surface source:
Riprap source :

Description	cu.yds/sta	x stations	= cubic yards
Ballast (4"-)	63	6.61	416
Surfacing (2 1/2"-)			0
Riprap			

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot	$2.50		
Dig and load	$1.00		
Crushing			
Purchase			
Haul *	$3.50	$3.50	$3.50
Spread	$0.80		
Compact	$0.45		
Strip	$0.97		
Reclamation			
TOTAL ($/cy)	$9.22	$3.50	$3.50

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	4.0						
Ave. Speed =	15	Ballast (4"-)	416	Cu. yds @	$9.22	/cu. yd =	$3,839
Delay (Hrs.)=	0.2	Surfacing (2 1/2	0	Cu. yds @	$3.50	/cu. yd =	$0
Cost / Hour =	$75.00	Riprap	0	Cu. yds @	$3.50	/cu. yd =	$0
CY / Load =	10						

Rock total = $3,839

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
						$0
						$0
						$0

Bands & Gaskets

Culvert total = $0

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
					$0
					$0
					$0

Structure total = $0

Sub-TOTAL = $6,486

VI. GENERAL EXPENSES: Overhead & General Exp. Add 11% $713

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	$100	5	$500
Grader	$400	1	$400
Compactor	$400	1	$400
Excavator	$450	1	$450
Dozer (D8)	$400	1	$400
Front end loader	$400	1	$400
Backhoe	$240	1	$240
Dozer (D5)	$240	1	$240

Total Mobilization = $3,270 Mobilization sub-total = $1,090

Road No. D-100 Recnstr. & A-Line/E-Line grading
Standard: Spur road (12' R.S.)
Stations: 302.13

SHEET TOTAL = $8,290

By: Greg Johnson Date: 04/10/06

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Steelhead Junction CONTRACT NUMBER: 30-079385

I. BRIDGE APPROACH PAVING PREPARATION:

Flat Rate -	Disposal Factor	Production Factor	Cost/ Day	No. of Days	Total Stations	Sub Total
Trap Creek E-Line					5.85	$0
Excavate existing surfacing			$1,200	1.00		$1,200
Stockpile salvaged surfacing			$750	1.00		$750
Ditching			$1,200	0.50		$600
Bridge rail replac. and road shoulder labor			$200	4.00		$800
Place shoulder rock			$750	1.00		$750
				Clear and Grub TOTAL =		$4,100

II. BRIDGE APPROACH PAVING:

Flat Rate -	Cost/ Station	Total Stations	Sub Total
Trap Creek E-Line	$3,761	5.85	$22,000
		0.70	$0
		0.00	$0
		0.00	$0

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul	0	0	$0	$0
Large Fills/ Cuts	0	0	$0	$0

Excavation TOTAL = $22,000

III. BALLAST AND SURFACING :

Ballast source:
Surface source: Commercial
Riprap source :

Description	cu.yds/sta	x stations	= cubic yards
Ballast (4"-)		5.85	0
Surfacing (1"-)	17	5.85	100
Riprap			

UNIT COSTS	Ballast	Surfacing	Riprap
Drill & Shoot			
Dig and load			
Crushing			
Purchase		$4.31	
Haul *	$5.90	$5.90	$5.90
Spread		$0.90	
Compact		$0.45	
Strip			
Reclamation			
TOTAL ($/cy)	$5.90	$11.56	$5.90

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

R.T. Miles =	40.0						
Ave. Speed =	30	Ballast (4"-)	0	Cu. yds @	$5.90	/cu. yd =	$0
Delay (Hrs.)=	0.2	Surfacing (1"-)	100	Cu. yds @	$11.56	/cu. yd =	$1,156
Cost / Hour =	$77.00	Riprap	0	Cu. yds @	$5.90	/cu. yd =	$0
CY / Load =	20						

Rock total = $1,156

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
						$0
Bands & Gaskets						

Culvert total = $0

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
Bridge Rails	Timber	12"x12"	140	$15	$2,100
Hardware/blocks					$200
					$0

Structure total = $2,300

Sub-TOTAL = $29,556

VI. GENERAL EXPENSES: Overhead & General Exp. Add 9% $2,660

VII. MOBILIZATION:

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	5	$500
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer (D8)	400	1	$400
Front end loader	400	1	$400
Backhoe	$240	1	$240
Dozer (D5)	$240	1	$240

* Move in costs are averaged over all three sheets.

Total Mobilization = $3,270 Mobilization sub-total = $1,090

Road No. Trap Creek E-Line
Standard: Bridge approach paving (12' R.S.)
Stations: 5.85

SHEET TOTAL = $33,306

By: Greg Johnson Date: 04/10/06